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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/309,766	05/11/1999	HIDEHIKO FUJIMURA	35.G2387	7945

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EXAMINER

RAMSEY, KENNETH J

ART UNIT	PAPER NUMBER
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2879

DATE MAILED: 03/12/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Applicati n No.

09/309,766

Applicant(s)

FUJIMURA ET AL.

Examiner

Kenneth J. Ramsey

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 January 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,4-14 and 16-24 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,4-14 and 16-24 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1, 2, 4-8, 10-14, 16-20 and 22-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mitsutake et al (US 5,760,538), in view of Kato et al (5,688,708) and Dynka et al (5,697,825) and Banno et al (JP-7-296731). Mitsutake et al discloses the assembly and evacuation of a surface conduction cathode type display device at column 10, lines 4-26. Note that Mitsutake et al state:

"After assembling the envelope (airtightly sealed container), the exhaust pipe (not shown) of the envelope is connected to a vacuum pump and the envelope is then evacuated to a degree of vacuum of approximately 10^{-7} Torr. Thereafter, the exhaust pipe is sealed. Note that a getter film (not shown) is formed at a given location within the envelope immediately before or after sealing the exhaust pipe as means for maintaining the inside of the envelope to a given degree of vacuum. Getter film is a film obtained by vapor deposition, where a getter material typically containing Ba as a principal ingredient is heated by means of a heater or high frequency heating. The inside of the envelope is maintained to a degree of vacuum of 1×10^{-5} to 10^{-7} Torr by the absorption effect of the getter."

Thus, Mitsutake et al teaches two separate embodiments: 1) activating a getter immediately before sealing the exhaust tube, and 2) activating a getter immediately after sealing the exhaust tube. In other words, Mitsutake is an anticipation of both embodiments. Further, the examiner takes Official notice that it is common in the art to seal an exhaust tube by baking the tube to a temperature at which the tube melts. It

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would have been obvious for one of ordinary skill in the art to employ a tube baking step to seal the exhaust tube of Mitsutake et al.

As to a preference for activating a getter prior to sealing the tube, it would have been obvious to one of ordinary skill in the art at the time of the claimed invention to activate the getter prior to sealing the exhaust tube, since Kato et al, column 4, lines 12-22 teach that gaseous contaminants produced during the exhaustion and sealing process can harm the cathodes if not removed or gettered prior to sealing the exhaust tube and since the patent to Dynka et al teaches an extended bake out process at about 400°C (prior to sealing) during which contaminants are both evacuated and/or gettered prior to sealing. Thus the sooner the getter is activated, the less chance of contamination of the active components of the device. Also, the non-evaporable getters as in Kato et al and Dynka clearly become activated prior to sealing contrary to applicants' arguments. See Kato et al, column 3, lines 5-20 which states "During the sealing step in the fabrication of UHV FED 100, outgassing of display components produces gaseous species which are received by the surface of the low temperature getter alloy component of first non-evaporable getter material 120, thereby contaminating the surface. Then absorbed contaminants diffuse from the surface into the bulk of the particle, thereby activating, rejuvenating the surface and restoring its gettering capability. The surface continues to getter as long as the bulk of the particle is not saturated with contaminants. This activation/rejuvenation process is accomplished through heating to a low temperature such as the sealing temperature. While this activation process begins at temperatures as low as 200°C, the rate of diffusion only

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becomes appreciable at temperatures above about 300°C ". These temperatures are each below the sealing temperature stated at column 4, lines 9-12. Also Dynka et al, column 3, lines 47-57 states, "The temperature is then increased further (e.g. 210°C – 310°C) and held for another relatively long time period to equalize temperature, outgas contaminants, and allow the internal furnace area and package to recover in vacuum.

At this stage the temperature is still well below the frit flowing point [sealing temperature] but the getter begins to be activated. The temperature is then increased to a temperature at which the frit outgases a mixing agent added to make a viscous paste (e.g. 325°C – 400°C). The package is held at this temperature for several hours and the getter becomes further activated. The temperature is then increased [to sealing temperature] " (emphasis added).

Mitsutake et al does not explicitly disclosed simultaneously baking the entire airtight vessel while evacuating; however, it is routine practice to simultaneously bake the vessel while evacuating in order to thoroughly evacuate the vessel. See Dynka et al, column 9, lines 28-67. Also see Banno et al, translation, top of page 2.

Further, Mitsutake et al is unclear as to whether or not evacuation is continued as the during the sealing of the exhaust tube. However, since there is inherent outgassing of absorbed gasses from the exhaust tube when it is sealed, it is routine to continue the baking and pumping until the exhaust tube has been sealed. Note herein is made that while Banno et al, translation, page two states that their second process, i.e. the sealing of the exhaust tube, is after vacuum exhaustion by the first process, this is not to say that the first process, i.e. baking and vacuum pumping, is discontinued

before or during the sealing of the exhaust tube. It only states that sealing is after a state of vacuum exhaustion has been reached. However, since it is important to maintain this state of vacuum exhaustion, it would have been obvious to one of ordinary skill in the art to continue the evacuating step in either Mitsutake et al or Banno et al during the sealing of the exhaust tube to maintain the state of vacuum. It may be that the method of baking the exhaust tube to near its softening temperature during the first process of outgassing, as disclosed and claimed by Banno et al, allows for the first process to be discontinued prior to sealing the exhaust tube by the second process because there is little or no outgassing of the exhaust tube during the second process, however, that would not make unobvious the step of continuing the exhausting step during sealing of the evacuation tube in Mitsutake et al, particularly where there the claimed process of Banno et al is not followed.

As to claims 5 and 6, the evacuation step is clearly both prior to and during the activation of the non-evaporable getter. As to claims 8 and 20, the use of a non-evaporable in the process of Mitsutake et al, would have been obvious to one of ordinary skill in the art since Kato et al teach the advantage of removing contaminants by both evacuation and gettering to avoid contamination of the active components prior to sealing. As to claims 10-12 and 22-24, it would have been obvious to one of ordinary skill in the art at the time of the claimed invention to include both an evaporable getter and a non evaporable getter in the process of Mitsutake et al as modified in view of the further advantages taught by Kato et al. Moreover, the evaporable getter is obviously

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degassed during the heating and evacuation of the device as are the other device components.

3. Claims 9 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mitsutake et al, Kato et al and Dynka et al as applied to claims 8 and 20 above, and further in view of Wallace et al (5,520,563). It would have been obvious for one of ordinary skill in the art to provide means for reactivating the non-evaporable getter such as taught by Wallace et al, column 6, line 66 through column 7, line 61, to thereby avoid the necessity of including a second evaporable getter.

Response to Arguments

4. Applicant's arguments filed January 28, 2002 have been fully considered but they are not persuasive. Banno et al has been discussed above. Except for the use of an evacuation tube, Kato actually discloses the same process as claimed by applicants. Thus Kato et al thoroughly bake their vacuum vessel during their step of evacuation and continue the evacuation during the sealing step because of gasses that are outgassed during sealing. Kato et al, column 4, lines 45 to 53 further suggest that their process be followed in the manufacture of vacuum vessels having exhaust tubes such as taught by Mitsutake et al. Getter activation is defined by applicants to comprise activation at outgassing temperatures, not at or above the sealing temperature; however, sealing is differently defined by applicants to comprise only final sealing, i.e. the actual closing of the exhaust tube, which in Mitsutake et al as modified would only be after outgassing of the device, i.e., after "activation" of the non-evaporable getter.

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5. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.


Directions for Responses

Any formal response to this communication should be directed to examiner Kenneth Ramsey, Art Unit 2879, and either
faxed to: 703-872-9318; or mailed to: Assistant Commissioner For Patents
Washington, D.C. 20231

Technical inquiries concerning this communication should be directed to Kenneth J. Ramsey, (703) 308-2324 (voice), (703) 746-4832 (fax).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

kjr
March 4, 2002


Kenneth J. Ramsey
Primary Examiner